Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

A280.39
M34Amo
Cop. 2

AMS-256

REMODELING SMALL POULTRY PLANTS TO MEET INSPECTION REQUIREMENTS

U.S. DEPT. OF AGRICULTURE
LIBRARY
APR 25 1962
CURRENT SERIAL RECORDS

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service
Marketing Research Division

PREFACE

The Poultry Products Inspection Act, recently enacted by Congress, caused considerable concern in the poultry industry as to the effect compulsory Federal inspection might have on our third largest source of farm income. Especially concerned are the many smaller poultry processing plants that must comply with equipment requirements of Regulations promulgated to carry out the Act. These Regulations are known as the "Regulations Governing the Inspection of Poultry and Poultry Products."

A great part of the volume of poultry produced for slaughter in the United States will require inspection under the Poultry Products Inspection Act. Compulsory inspection will be made at the point where poultry is slaughtered or processed--the processing plant.

This report is the result of a study of small and medium size poultry processing plant facilities and equipment.

The purposes of the study were to determine the inadequacies of present processing facilities in terms of Regulation requirements, minimum facility needs to comply with the Regulations, and an approximate cost for making necessary alterations.

Acknowledgment is made to Edward H. Hageman and Conner H. Kennett of the Poultry Division, for collecting data on field trips, and to John A. Hamann, Marketing Research Division, for direct collaboration in preparing this report.

The information contained in this report has been presented orally at many meetings of trade associations, industry, and Government. It has been used extensively by the Inspection Branch of the Poultry Division to illustrate requirements in small poultry processing plants, and for instruction purposes in technical schools.

June 1958

CONTENTS

	Page
Summary	iii
Introduction	1
Plant A	2
Existing plant layout and facilities	3
Suggested plant layout and cost of alteration	8
Plant B	10
Existing plant layout and facilities	11
Suggested plant layout and cost of alteration	17
Plant C	19
Existing plant layout and facilities	19
Suggested plant layout and cost of alteration	24
Plant D	26
Existing plant layout and facilities	26
Suggested plant layout and cost of alteration	29
Conclusions	32

SUMMARY

Of the estimated 3,000 plants in the United States in which poultry is slaughtered or processed, approximately one-third ship poultry interstate.

Recently enacted legislation requires that plants shipping interstate shall be Government inspected. About 1,000 plants will be affected by this legislation and most of them will have to make changes in their buildings or equipment in order to comply with the law. Some plants will need major construction changes, others will require only minor changes. The changes necessary in any one plant can be determined only through an official survey by the Inspection Branch, Poultry Division, Agricultural Marketing Service, U. S. Department of Agriculture. The Secretary of Agriculture has designated this Branch to administrate Regulations under the Act.

The Agricultural Marketing Service has made a study of poultry processing plants in several areas of the country to determine what they require in order to comply with the Regulations under the Poultry Products Inspection Act. It was a case study designed to provide information as to minimum facility requirements and approximate overall costs of making alterations, and to construct suitable plant layouts.

Any alteration, large or small, will require an investment of time and money. It should be the concern of every processor to consider not only Regulation requirements but also the improvement of plant and equipment layout when remodeling. In many cases, efficiency can be increased greatly by relocating one or two pieces of equipment.

Although the Regulations require facilities and equipment that will enable the production of clean, wholesome products in a clean and sanitary manner, they do not necessarily require the use of expensive, elaborate facilities and equipment. Most of the plant buildings used as examples in this report are modest structures built by the owner; and many pieces of homemade equipment, designed by him, were suitable for the purpose intended and acceptable without modification.

In estimating the costs for making the alterations and additions, a national average for cost of building materials, processing equipment, and wages paid for specialized labor was used. These costs will vary and, in many cases, can be brought below the average.

The choice of building materials will affect the initial cost. It is advisable to consider factors other than purchase price. While some less expensive materials are acceptable and will serve the purpose well, better quality materials will last longer, thus reducing replacement costs. Cost of maintenance also should be considered.

New and improved building materials and poultry processing equipment are being developed every day. For this reason, the Regulations specify merely the nature of the material and equipment suited to the sanitary needs of the operation.

There are many combinations of acceptable building materials and equipment that can be used in a poultry processing plant. Personal preference and cost usually are the determining factors in the final selection. Selection of a type of building material that will provide sound construction, and equipment that will enable efficient production of a clean and wholesome product, are important considerations.

REMODELING SMALL POULTRY PLANTS TO MEET INSPECTION REQUIREMENTS

By Kenneth H. Brasfield, agricultural marketing specialist,
Transportation and Facilities Branch, Marketing Research Division, and
Dr. Raymond D. Wenger, assistant chief,
Inspection Branch, Poultry Division

INTRODUCTION

The Poultry Products Inspection Act provides for compulsory inspection by the United States Department of Agriculture of poultry and poultry products which move in interstate or foreign commerce or in designated major consuming areas. Its purpose is " . . . to prevent the movement in interstate or foreign commerce or in a designated major consumer area of poultry products which are unwholesome, adulterated, or otherwise unfit for human food."

Poultry-processing plants can be classified into three major categories as to size--small, medium, or large. A factor that determines their classification is the volume of poultry and poultry products that they process. Some large plants produce 900,000 pounds of poultry in a week. This could constitute the volume output for an entire year in a small plant.

Many of the large poultry-processing plants are now operating under the voluntary inspection program administered by the Inspection Branch of the Poultry Division, AMS. This program provides an inspection service to the processor at his request and expense. He must provide and maintain plant facilities in accordance with regulations governing the voluntary program. Therefore, his facility will need practically no alteration due to the parallelism of voluntary inspection Regulations and compulsory inspection Regulations. Persons in the small to medium category generally do not operate under the voluntary program and are not familiar with Federal inspection Regulations.

One misconception of how small plants might be affected could come from visiting large plants utilizing the voluntary inspection program. Some of these facilities are big, elaborate structures with large receiving and shipping docks, paved driveways and truck areas with intricate underground drainage systems, and even separate buildings for related operations. Inside most of these plants are separate rooms with glazed tile walls for each of the processing operations. There is fully automatic equipment working in unison with power driven, mechanical, overhead conveyors that carry the poultry through the various processing steps from room to room, from slaughter to packaging. The handling, packing, icing, storing, and the handling of packaged product is done with modern and frequently expensive materials-handling equipment.

Much of the equipment, plant facilities, and even some types of the building materials in larger plants are to enable production of a large volume. The same combination of equipment, plant facilities, and building

materials used for a small volume would not be economical. Small poultry processing plants do not require these things to produce their volume of product efficiently and in a sanitary manner.

From the following illustrations of facilities in existing poultry-processing plants, the conclusions with respect to their acceptability, and the suggestions for alteration to make these facilities acceptable, it is hoped to convey factual interpretations of Regulation requirements and to stimulate practical planning for remodeling the small, poultry-processing plant.

Four plants were chosen in the study to be used as samples. The names and locations of these plants will remain anonymous. They will be referred to as "A", "B", "C", and "D".

In studying these plants, a layout drawing and photographs were made of each facility as it existed. A second layout drawing was made to show how each plant might look after the necessary alterations and suggestions for layout improvement are made.

Two types of processing are represented by these four plants. The first is the plant in which all of the processing operations are conducted in one room. It is here represented by plants "A" and "B". The second is the plant in which the processing operation is done in more than one room, and is represented by plants "C" and "D".

PLANT A

The first of these plants, Plant "A", (fig. 1) is a small turkey-processing plant with an annual volume of approximately 2,000 birds. Operation of this plant is confined to the preholiday season. It is a one room,

NEG. BN-6397

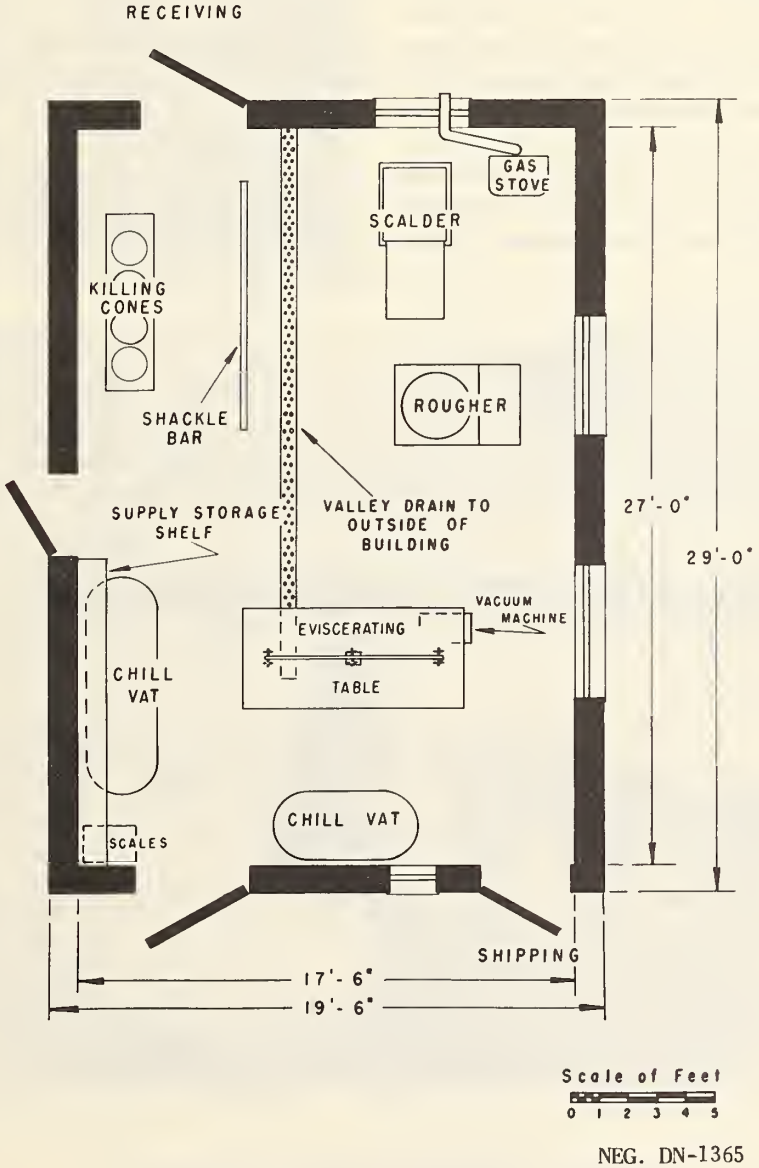
Figure 1.--Outside view of a small turkey-processing plant. Plant A.

detached, concrete-block and wood building that is about 20 x 30 feet in size.

The killing, scalding, picking, eviscerating, chilling, and packaging operations are all performed in one room. This is permissable under the Regulations provided all of these operations are not being done at the same time. For instance, the killing, scalding, and picking operations could be performed at one time. Then, after the plant is thoroughly cleaned, eviscerating and packaging could be done.

Existing Plant Layout and Facilities

The doorway at the top of the drawing (fig. 2) is for receiving. It is equipped with a wood, single-swing door that is not self-closing. It opens



NEG. DN-1365

Figure 2.--Layout of Plant A. Existing facilities.

directly into the killing area. Regulations require such doors to be self-closing. Any conventional door-closing device of adequate size to self-close this door is satisfactory. To the right of the killing area is the scalding and picking area; and, in the lower part of the room is the eviscerating, chilling, and packaging area.

The inside walls are of concrete-block and wood. Building materials such as these are not considered to be impervious to moisture. The Regulations require walls, posts, partitions, and doors in rooms where exposed products are prepared or handled to be impervious to moisture to a height of six feet above the floor. Therefore, it would be necessary to refinish these walls and doors with a material that is not susceptible of being penetrated by moisture. Such materials include, but are not limited to, ceramic tile, metal tile, smooth metal panels, cement plaster, and some forms of paint and plastic.

The windows of this plant are not equipped with screens. Openings to the outside of the building should be protected by properly fitted screens or other suitable devices, against the entrance of flies and other insects.

The killing area (fig. 3), located in the upper left-hand corner of the building, is equipped with killing cones and a homemade shackle bar. This sort of equipment is satisfactory and acceptable as to construction, but it must be maintained in a clean and sanitary condition.

NEG. BN-6415

Figure 3.--Killing area of Plant A.

NEG. BN-6426

Figure 4.--Scalder.

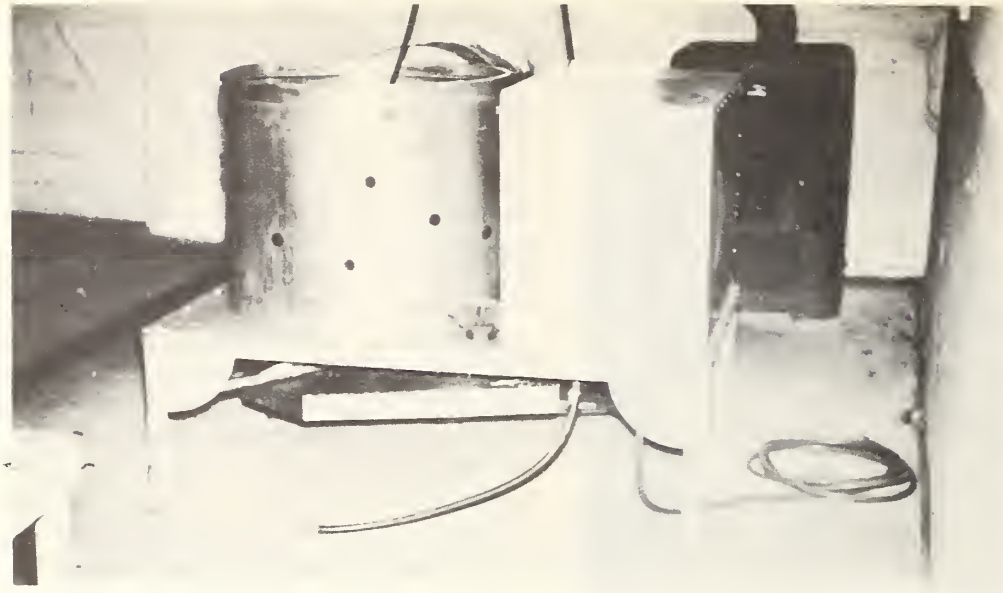
To the right of the killing area is the scalder (fig. 4). It is a commercial-type scalder often referred to as a "batch scalder." Birds are placed in the basket which rotates, off-center, submerging the birds in scald water. This piece of equipment is satisfactory as far as material is concerned; however, it has been found that in actual use the operator is oftentimes negligent in replacing dirty scald water. It is recommended that piping be installed for a convenient overflow and inflow of water in order to maintain sanitation in the tank. The water inflow or intake should be above the tank where there is no direct connection between the tank and the potable water line, and water overflow should be at the full water level of the tank. The overflow of water from the scald tank should be discharged in close proximity to a floor drain, and in a manner that will not interfere with the operator. If pipes are used to carry the overflow of water from the tank to the floor or floor drain, these pipes should be capable of being disassembled for cleaning. Both overflow outlet and pipes should be of sufficient size to permit feathers and water to be carried off.

There is a wood wall next to the scalder. This wall will have to be covered or coated with a material that will make it impervious to moisture. It should make a coved union with the floor to prevent water and plant waste from seeping underneath and behind the wall.

The picking machine is adjacent to the scalder (fig. 5). This piece of equipment, in its present good condition, is acceptable. It is placed well away from the wall and other equipment so as to be accessible for thorough cleaning, maintenance, and to permit the removal of feather accumulation.

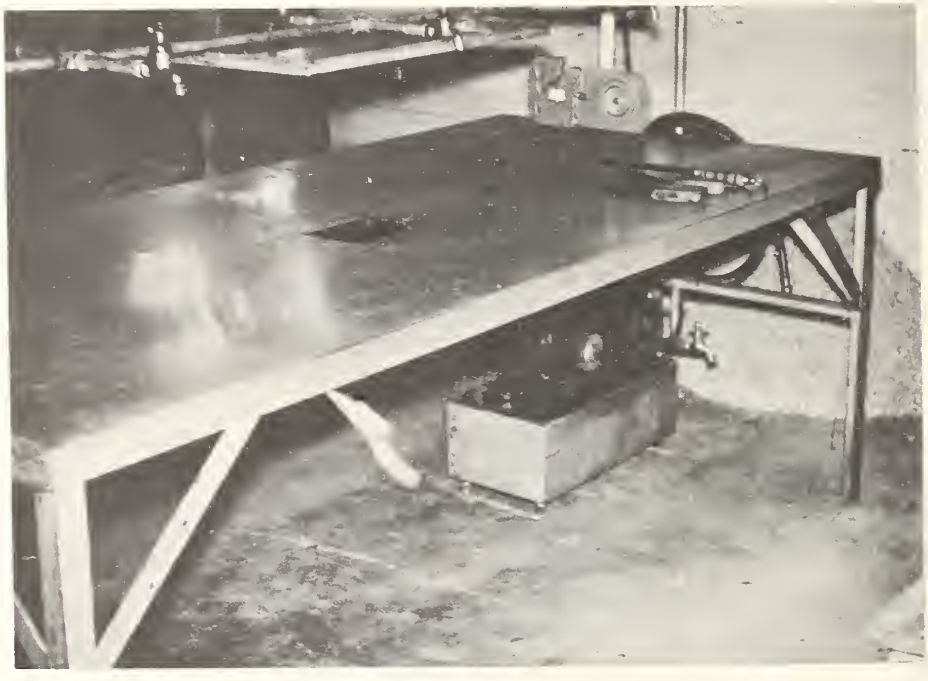
The exposed pipe at the junction of the wall with the floor should be elevated above floor level to facilitate proper cleaning.

The corner of the eviscerating table is in the left foreground of figure 5. This is a homemade table of galvanized metal and angle-iron construction. (Figure 6.) Its construction permits thorough cleaning and is satisfactory. It is equipped with 6 hand-operated faucets. These faucets must be operated with foot pedals or permitted to run continuously during the eviscerating operation in order to meet requirements. There are no individual trays or hanging facilities at the eviscerating table. Such



NEG. BN-6440

Figure 5.--Picking machine (rougher).



NEG. BN-6417

Figure 6.--Eviscerating table.

facilities should be provided and used during the eviscerating operation. Single, stationary shackles or other suitable hanging devices located at each of the 6 faucets are recommended for use here.

The machine underneath the table is a vacuum machine used in the packaging operation. The packaging is done on the eviscerating table. This practice is permissible provided packaging is done after the eviscerating operation is completed and the table has been thoroughly cleaned.

Wooden posts (fig. 7) in rooms where exposed product is processed or handled, should be finished in the same manner as walls. Open cracks or breaks in wood beams above 6 feet from the floor should be filled, and the beams finished with a moisture-resistant material such as paint or plastic.

NEG. BN-6394

Figure 7.--Wooden posts and beams.

The steel drums at the door are offal and feather containers. They must be equipped with tight-fitting covers in order to be acceptable.

The ceiling is enclosed with a hard, moisture-resistant wallboard. Seams, where the sheets of wallboard join, should be sealed with tape, metal, or wood strips. Where the seams are sealed with wood strips, the strips should be finished so as to be moisture resistant.

The floor (fig. 8) is concrete and pitched to a centrally located valley drain. This type of floor is satisfactory. On close examination of the photograph, note that the floor has a brush finish rather than a smooth, trowel finish. A floor with a slightly rough finish is more desirable for worker maneuverability and safety in rooms or areas where the floor will be wet.

NEG. BN-6404

Figure 8.--Floor

The valley drain leads to the outside of the building. It will be

471744 O - 58 - 2

necessary to close the drain opening through the wall and connect this valley drain to a proper drainage system. Each floor drain should be installed with approved traps and vents. P-U or S-shaped traps are acceptable. Bell-type traps are not acceptable.

Supplies are stored on two, open, 1 x 12 inch wood shelves suspended from the ceiling and well above the floor (fig. 9). Storage of supplies in this

NEG. BN-6408

Figure 9.--Supply storage.

manner is satisfactory. The supplies can be kept dry and the open shelves can be readily cleaned. However, the unfinished, wooden shelves used here should be finished so as to be moisture resistant or they should be replaced by metal shelves.

Toilet facilities for the employees are provided in the plant owner's residence. Restrooms apart from the plant building are permissible where the number of employees is relatively small and the toilet facilities provided are adequate.

Suggested Plant Layout and Cost of Alteration

Figure 10 is a drawing showing how the plant might look after the necessary alterations and additions are made. The doors have been equipped with self-closing devices; the windows are equipped with screens; an exhaust fan is installed in the window near the scalder to remove steam; a hot water heater is provided to supply hot water for clean-up purposes; singeing equipment and bird-hanging facilities have been installed; and (not shown in the drawing) the walls, doors, and posts have been refinished

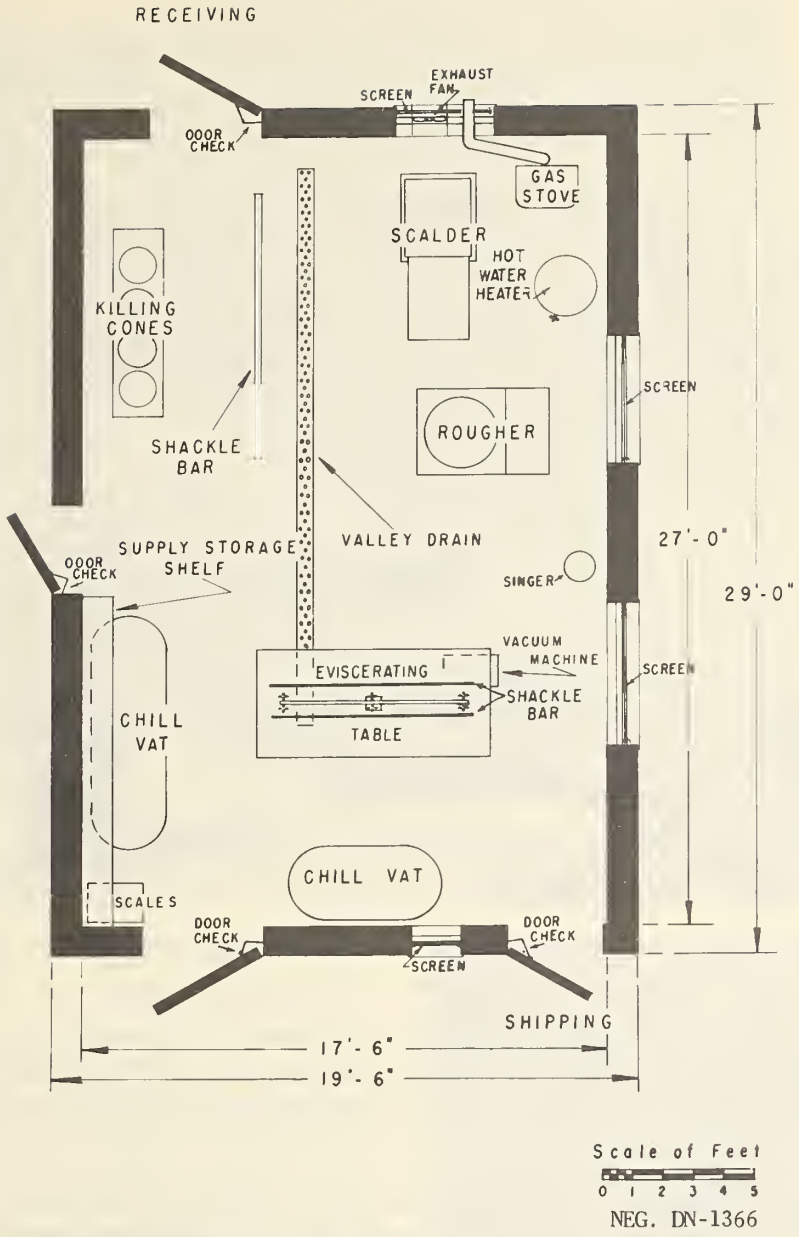


Figure 10.--Suggested layout of Plant A.

to a height of 6 feet with a material impervious to moisture and above 6 feet refinished so as to be moisture resistant. All wooden surfaces above 6 feet (such as shelving and beams) have been refinished so as to be moisture resistant.

The estimated overall cost in making these additions and alterations, not including the cost for providing a proper drainage system for the building, is $1,500.

PLANT B

In the second plant, designated Plant "B", the processing is also done in one room (fig. 11). This is a chicken-processing plant with an annual

NEG. BN-6399

Figure 11.--Outside view of Plant B.

volume of about 400,000 birds. The building is a two-story, concrete-block building with a partial basement. The first and second floors are used for growing poultry. The basement is used for processing poultry. Immediately behind the truck can be seen the doorway leading into the basement.

Figure 12 is inside the room on the first floor immediately above the processing plant. It is one of the rooms that is used for growing poultry. This room has windows on both sides and an air-circulating fan for ventilation. Raising live poultry in the same building and in an area immediately above the processing operation is not forbidden provided certain precautionary measures for sanitation are taken. The floor of the area above the processing plant should be covered and/or the ceiling of the plant should be enclosed with a tight-fitting, moisture-resistant covering that will prevent dust or moisture from filtering through and onto equipment or exposed product.

The floor in figure 12 consists of wood planks covered with 6 inches of litter (fig. 13). In a case such as this, it will be necessary to remove the litter and cover the floor with a tight-fitting, moisture-proof covering that continues up each wall to a height well above the litter. Sheets of galvanized iron would serve well in withstanding the rough treatment of shoveling.

NEG. BN-6406

Figure 12.--First floor immediately above processing plant.

Existing Plant Layout and Facilities

Figure 14 is a drawing of the plant layout in the partial basement. The plant is about 60 by 60 feet in size and has 1 room for processing and packaging, 3 freezers, 1 cooler, a supply storage room, boiler room, and a restroom. The egg cooler in the upper right-hand corner is not in use. There is one outside doorway. It is used for both receiving and shipping.

The killing, scalding, and picking area is in the upper part of the processing room. It is equipped with a bleeding rack, table, scalder, 2 mechanical pickers, and 2 chill tanks. The tray is a cafeteria-type tray used to hold birds before pinning. An exhaust fan provides good ventilation and removes steam accumulation from the scalder and pickers. A well-placed,

NEG. BN-6398

Figure 13.--Wood floor and 6-inch-deep litter.

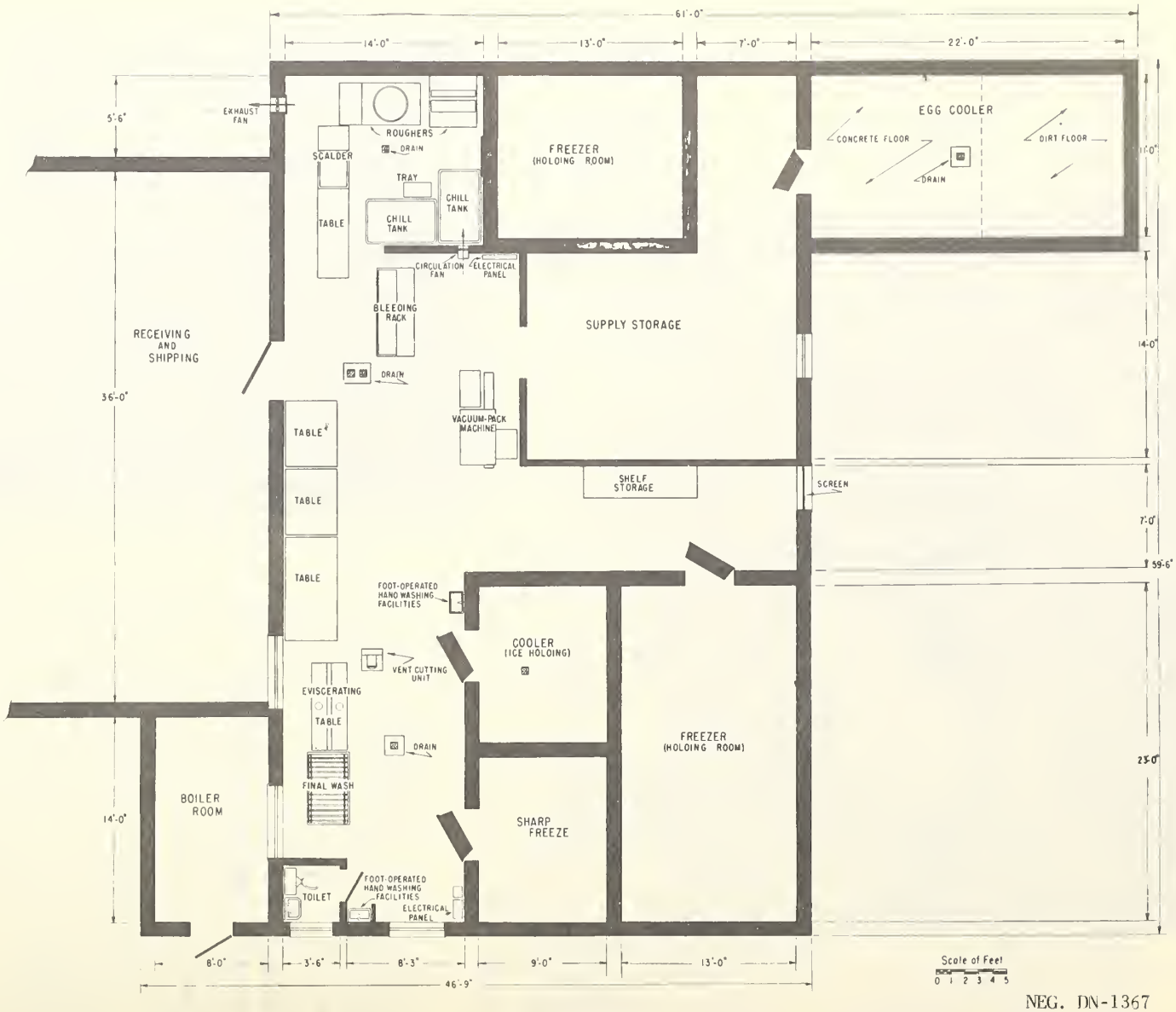


Figure 14.--Plant B layout. Existing facilities.

6-inch floor drain permits adequate removal of water from the dressing area. There are no facilities for singeing or washing the dressed birds. Such facilities should be provided.

The eviscerating, chilling, and packaging area is in the lower part of the processing room. The eviscerating operation utilizes 4 tables (including an eviscerating table), a vent cutting machine, and a final wash station. This area is equipped with two foot-operated, hand-washing lavatories. The cement floor is pitched to two 6-inch floor drains permitting good floor drainage from the eviscerating area.

The toilet doorway, opening directly into the eviscerating area, is not equipped with a self-closing door. It is necessary that this door be made self-closing. The toilet should be ventilated to the outside by means other than a window. This is to provide ventilation during the winter months when the window would be closed.

None of the windows are screened. They should be properly fitted with screens.

The doorway leading to and from the processing plant (fig. 15) is equipped with a self-closing door. Spring hinges were used very effectively as the device to keep the lightweight door closed. The premises outside the doorway are paved and graded so as to drain away from the building and doorway, thus eliminating the need of drains for this area. This area is maintained in an acceptable manner.

NEG. BN-6439

Figure 15.--Single doorway to processing plant.

Immediately inside the doorway is a homemade bleeding rack constructed of galvanized pipe framing and stainless steel (fig. 16). It is hooded at the top, rear, and bottom to confine feathers and blood from the killing operation. It is equipped with stationary shackles for hanging about 15 birds at one time, and constructed so as to permit thorough cleaning. This piece of equipment is satisfactory and acceptable.

The lighting in this area, and in the scalding and picking area beyond, is not adequate. At least 30 foot candles of light intensity should be provided at work stations in these areas.

The table extension to the scalder (fig. 17) is homemade and of galvanized pipe and stainless steel construction. It is constructed to permit thorough cleaning and is satisfactory.

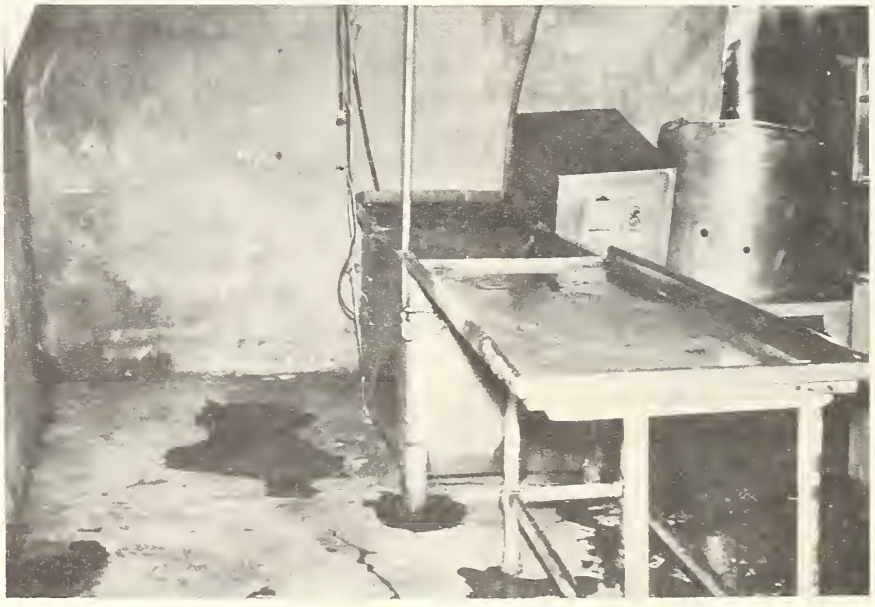
NEG. BN-6425

Figure 16.--Bleeding rack.

The scalder is of the same type used in Plant "A". It, too, does not have an overflow for water. The water inflow pipe, at the left forecorner of the scalder, is connected directly to the scalder. This potable water pipe should terminate where there is no direct connection between the scald tank and the water line. It should be equipped with a water overflow as described for the scalder in Plant "A".

Figure 17 also shows the kind of walls and floor that are throughout the plant. The walls are cement plaster on concrete block and the floor is concrete. Walls like this, having a rough surface, are not considered satisfactory. They should have a smooth finish from the floor to the ceiling in order to be acceptable.

At some places where the wall and floor join, such as the junction in the lower left-hand corner of the picture, the cement plaster has chipped away, leaving a rough, hard-to-keep-clean area. (Figure 18.) Such places will have to be refinished to the extent of filling in the cracks and making a smooth, coved union with the

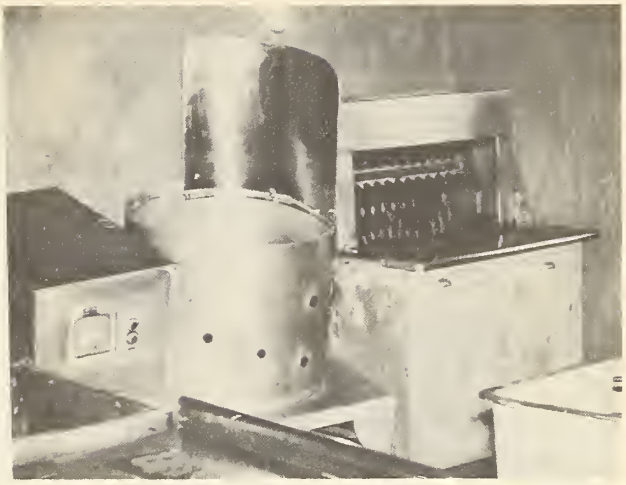


NEG. BN-6393

Figure 17.--Table and scalder.

NEG. BN-6438

Figure 18.--Chipped plaster at wall to floor junction.



NEG. BN-6400

Figure 19.--Picking equipment.

NEG. BN-6401

Figure 20.--Chill tanks.

floor. This will permit proper and thorough cleaning to avoid waste accumulation in the cracked area.

There are two mechanical pickers used in the defeathering operation (fig. 19). The lighting of this area is not sufficient; the equipment is acceptable.

The pickers are approximately 6 inches from the wall and 8 inches apart. A good clean-up job could be done much easier if the pickers were located farther from the wall and farther apart.

Chill tanks (fig. 20) are located in the scalding and picking area. They are used for holding the dressed birds prior to evisceration. This equipment is acceptable as to construction, but not as to present usage. Water in these tanks is used simultaneously for bird washing and chilling. It will be necessary to install additional equipment whereby each carcass can be washed individually by water spray before being placed into the tanks.

"Equipment and utensils used for preparing, processing, or otherwise handling any product in the plant shall be suitable for the purpose intended and shall be of such material and construction as will facilitate their thorough cleaning and insure cleanliness in the preparation and handling of products." This is a quotation from the Regulations and pertains to conditions as illustrated in figure 21. The use of wooden floor racks, boxes, or tables in rooms where exposed product is processed or handled is not permitted.

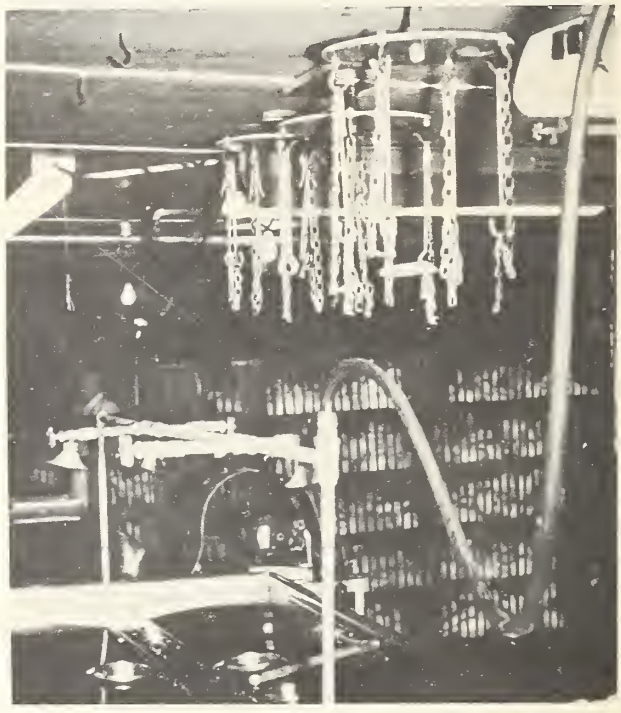
471744 O - 58 - 3

NEG. BN-6416

Figure 21.--Pinning.

Equipment for eviscerating is in the foreground. The 3 homemade hanging devices over the eviscerating table will hold 4 birds individually suspended on drop shackles attached to a circular, revolving, metal plate. These devices are acceptable if they are kept clean and free from rust. The water pipes over the eviscerating table have become corroded. These pipes will have to be replaced.

Figure 22 is a view from the eviscerating area showing live poultry in coops preparatory to killing. It would be permissable to continue bringing live poultry into this area provided no eviscerating is being done or will be done until after the birds are killed and dressed and the plant has been thoroughly cleaned.



NEG. BN-6413

Figure 22.--Eviscerating area.

Figure 23 illustrates unsatisfactory conditions in the hallway between the supply room and the freezer. Although this area is used primarily for miscellaneous storage, the ceiling would have to be enclosed and sealed to keep out dust or moisture filtration from the live poultry area above. The window opening is not protected by glass; therefore, the torn screen would have to be replaced or repaired to guard against the entrance of flies or other insects.

Another example of conditions requiring correction is the ceiling and door facing in the ice-holding cooler (fig. 24). These unfinished wooden surfaces have become water-soaked and mouldy. It will be necessary to finish or replace the exposed wood areas with material that is impervious to moisture.

NEG. BN-6414

Figure 23.--Open ceiling and torn screen.

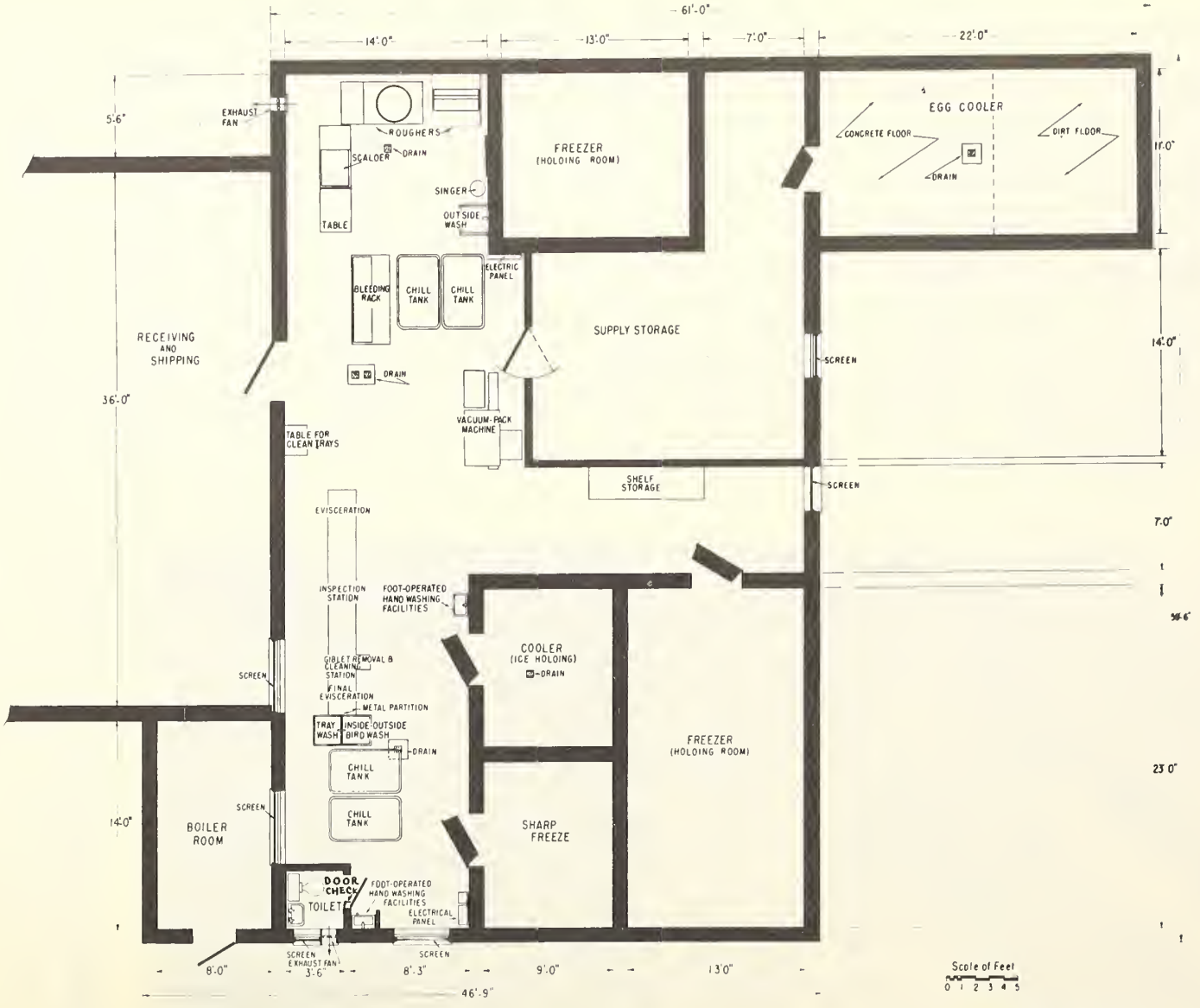
NEG. BN-6396

Figure 24.--Ceiling in ice-holding cooler.

Suggested Plant Layout and Cost of Alteration

Figure 25 is a drawing showing the plant as it might look after required layout and facility changes are made. All changes, including those the drawing cannot show, are:

1. Repair wall to floor junction in the scald area.
2. Refinish walls in processing room to a height of six feet with a smooth material that is impervious to moisture.
3. Refinish balance of walls so as to be smooth and moisture resistant.
4. Repair hole in ceiling.
5. Refinish ceiling in processing plant so as to be dust and moisture proof.
6. Repair and refinish ceiling in ice-holding cooler so as to be impervious to moisture.
7. Install screens in windows.
8. Ventilate toilet to outside by means other than window.
9. Install self-closing door to supply room.
10. Increase lighting to 30 foot candles at all work stations and provide 50 foot candles of light intensity at inspection station.
11. Install singeing equipment in picking area.
12. Install outside bird wash in picking area.
13. Install acceptable equipment at the evisceration operation that will permit each carcass to be identified with its viscera at inspection and yet be separate and distinct from other carcasses and viscera.



NEG. DN-1368

Figure 25.--Suggested Plant B layout.

14. Install a self-closing device on the restroom door.

The estimated overall cost for materials and labor in making the above corrections is $3,000.

PLANT C

Plant "C" (fig. 26) represents the small poultry-processing plant in which the processing operation is done in more than one room. It is a

NEG. BN-6395

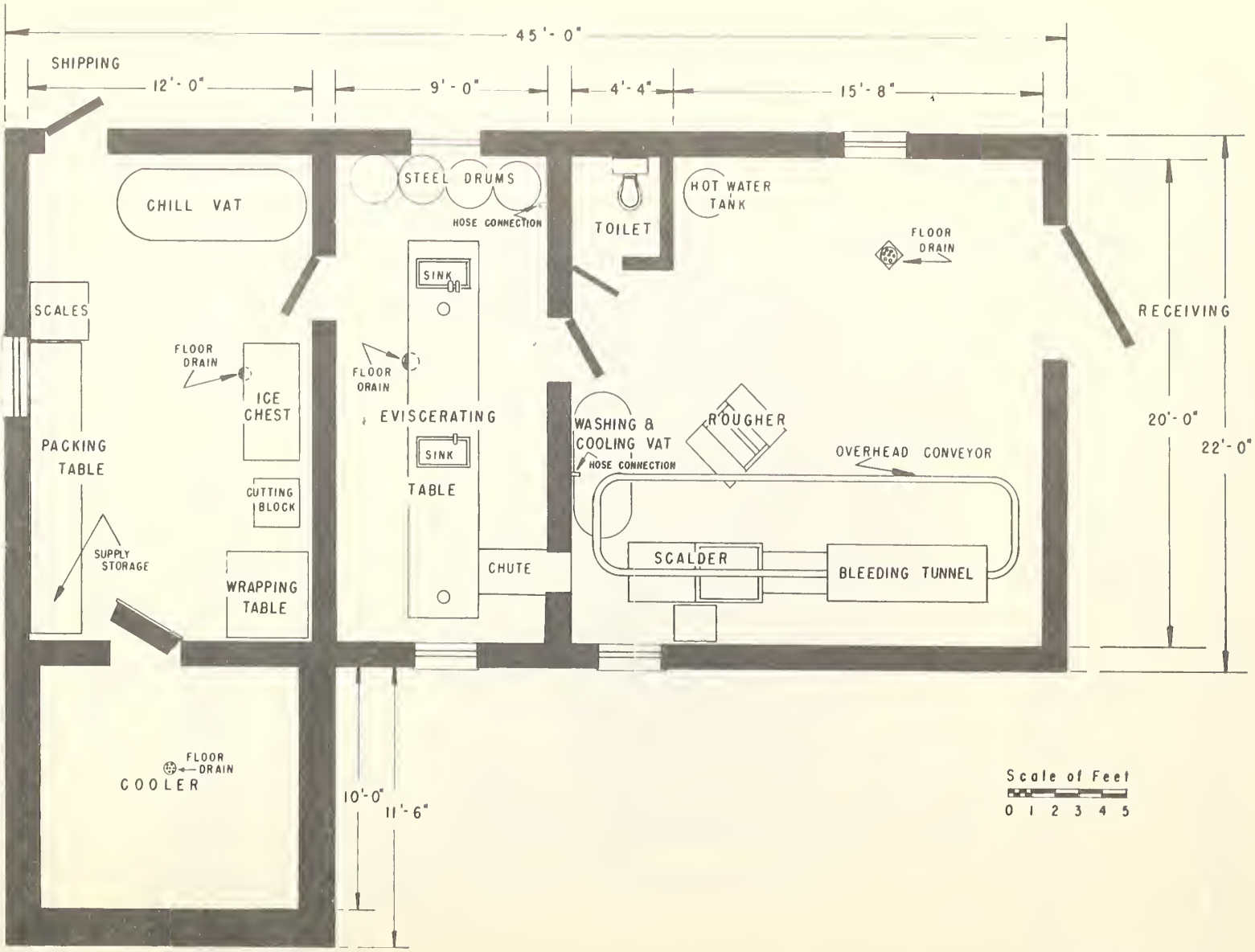
Figure 26.--Outside view of Plant C.

chicken- and turkey-processing plant with an annual volume of about 30,000 chickens and 5,000 turkeys.

The building is a detached, concrete-block structure about 22 x 45 feet in size. It has five separate rooms. There is a killing, scalding, and picking room; an eviscerating room; a chilling and packing room; a cooler; and a restroom.

Existing Plant Layout and Facilities

The killing, scalding, and picking room on the right; restroom; eviscerating room in the center; and chilling and packing room on the left are all similar in construction in that each has concrete block walls, a concrete floor, and an enclosed ceiling of hard, moisture-resistant wallboard (fig. 27). The concrete floors in all rooms, except the restroom, are



NEG. DN-1363

Figure 27.--Plant C layout. Existing facilities.

pitched to trapped floor drains; thus providing adequate and efficient removal of water from the processing operations.

None of the doors in the plant are self-closing. It is necessary that they (with the exception of the cooler door) be equipped with self-closing devices. The windows are not screened. They should be equipped with properly fitted screens if they are to be opened. There are no hand-washing facilities in the plant.

An overhead, manually-operated conveyor, a bleeding tunnel, scalder, mechanical picker, and a washing and cooling vat make up the equipment for the killing, scalding, and picking room.

Figure 28 is an end view of the bleeding tunnel next to the scalder. It has an open top, concrete block walls, and a coved concrete bottom. The construction is acceptable for Regulation compliance, but it should not be satisfactory to plant management as a properly designed facility. As a bleeding tunnel for chickens, it serves well. It is too narrow for turkeys. The rough surface of the concrete blocks makes maintenance for cleanliness and sanitation difficult. It would be advisable to widen this tunnel and refinish the inside walls with a smooth, impervious material to facilitate proper and thorough cleaning.

NEG. BN-6429

Figure 28.--Bleeding tunnel.

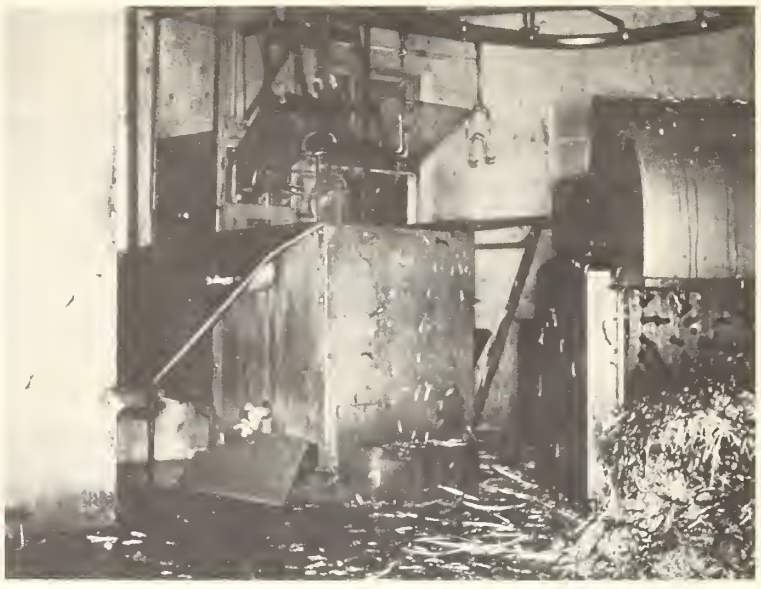
The scalding equipment, in the center of figure 29, is composed of a gas-heated scald tank equipped with a scalder chute and dunking attachment. It is recommended that the scald tank be equipped with an inflow and overflow for water as described for the scalders in Plants "A" and "B".

The use of plywood at the bottom of the scalder to keep out feathers is not permissable. Metal, used in place of the plywood, would be acceptable.

To the right of the scalder is the rougher or mechanical picker. It is well situated, as shown in figure 27, to permit thorough cleaning.

Figure 30 is a picture of the washing and cooling vat. The opening in the wall above the vat leads onto a chute to the eviscerating table in the next room. (Figure 27).

This vat is used for washing the dressed birds after picking and before evisceration. This method of bird washing is not permitted. A foot-operated or continuous water-flow washer should be provided in order that each bird can be washed individually prior to being eviscerated.

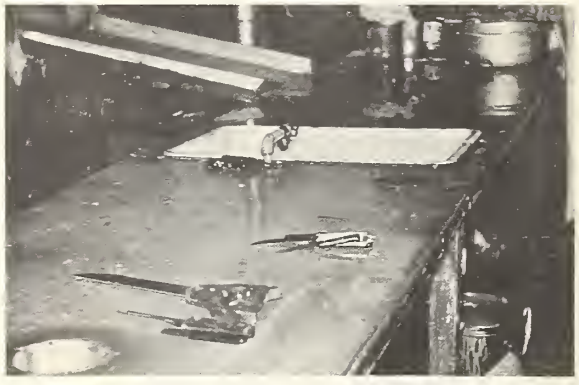


NEG. BN-6403

Figure 29.--Scalder and rougher.

NEG. BN-6432

Figure 30.--Washing and cooling vat.



NEG. BN-6421

Figure 31.--Eviscerating table.

The chute and the eviscerating table in the eviscerating room (fig.31) are constructed of wood and covered with metal. This type of construction is not acceptable in equipment used in the processing of edible product. Both the chute and table should be made entirely of metal or other impervious material and constructed so as to permit thorough cleaning.

Equipment that will permit clean and sanitary methods resulting in sanitary processing, proper inspection, and the production of wholesome poultry and poultry products should be installed in the eviscerating area. Such equipment will permit each carcass to be identified with its viscera at inspection and yet be separate and distinct from other carcasses and viscera.

Figure 32 illustrates a need for additional equipment in order to conduct the eviscerating operation efficiently and in a sanitary manner. Each bird should be hanging from individual shackles or held by individual, impervious trays.

NEG. BN-6431

Figure 32.--Poultry on eviscerating table.

NEG. BN-6430

Figure 33.--Sink for washing edible products.

NEG. BN-6412

Figure 34.--Final outside wash.

Figures 33 and 34 show a type of equipment for and method of bird washing that is not acceptable under the Regulations. Washing facilities that are foot-operated or of a continuous water flow type should be provided so that each bird can be washed individually by water spray.

Steel drums, such as those shown in figure 35, are not acceptable as chilling and defrosting tanks. Such tanks should be of noncorrosive metal or other suitable material impervious to moisture and of seamless construction with edges rolled outward. The container illustrated is satisfactory for offal and feathers, if equipped with a tight-fitting cover.

NEG. BN-6422

Figure 35.--Steel drums used in product chilling.

Suggested Plant Layout and Cost of Alteration

Figure 36 shows how Plant "C" might look after alterations are made. A section of the wall separating the eviscerating room and the chilling and packing room has been removed. Since the Regulations do not require the eviscerating, chilling, and packing operations to be in separate rooms, this section of wall was removed to provide space for the installation of equipment necessary for efficient processing in accordance with inspection requirements.

The alterations required for this plant to comply with the Regulations are:

1. Refinish walls and doors in the picking, eviscerating, and packing rooms to a height of 6 feet with a material that is impervious to moisture.
2. Refinish walls and doors at heights above 6 feet so as to be moisture resistant.
3. Equip all doors, except cooler door, with self-closing devices.
4. Ventilate toilet to the outside.
5. Install foot-operated, hand-washing lavatory in picking room.
6. Install singer after the picking operation.
7. Install outside bird wash after the picking operation.
8. Install acceptable equipment in eviscerating room that will permit each carcass to be identified with its viscera at inspection and yet be separate and distinct from other carcasses and viscera.
9. Install inside-outside bird wash in eviscerating room.
10. Install foot-operated, hand-washing lavatory in eviscerating room.
11. Screen windows.

The estimated cost for materials and labor in making these alterations is $3,000.

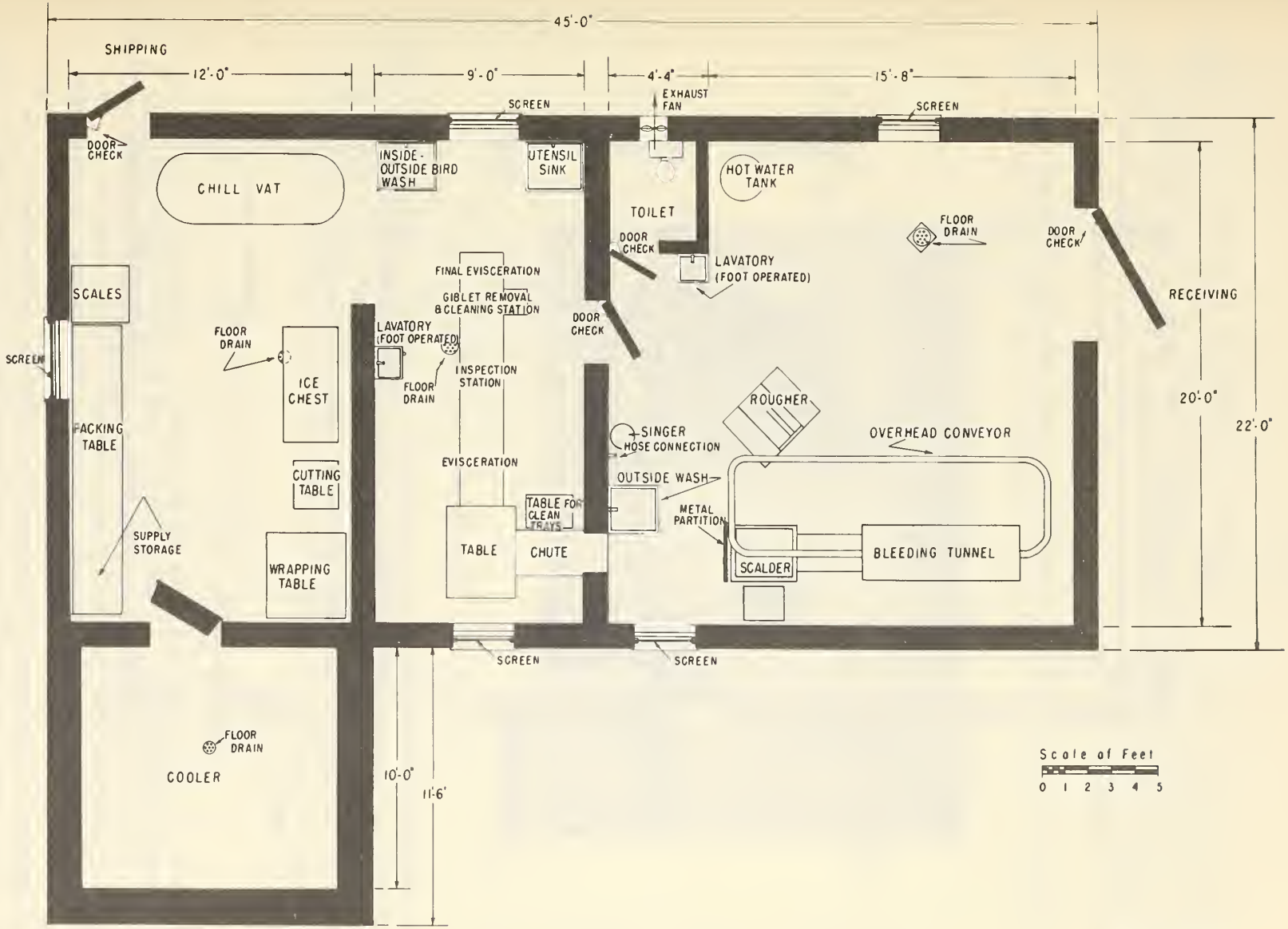


Figure 36.--Suggested layout for Plant C.

PLANT D

Plant "D" is also a plant in which the processing operation is conducted in more than one room. It is a turkey-processing plant with an annual volume of about 15,000 birds. This plant has four rooms: A killing, scalding, and picking room; an eviscerating, chilling, and packing room; a boiler room; and a freezer. It is approximately 30 x 60 feet in size. Toilet facilities for the employees are furnished in the plant owner's residence.

Figure 37 is a view of the rear of the plant showing the receiving doorway on the left. The door on the right is near the picking operation. The

NEG. BN-6420

Figure 37.--Outside view of Plant D.

grounds immediately outside these doorways are not paved. Loading out feathers and offal can lead to impregnating unpaved ground with refuse and drainage, an unsatisfactory condition that would attract flies. Such areas at receiving and loading-out doorways should be paved and provided with a drain if the amount of activity in these operations is such that insanitary conditions will result.

Existing Plant Layout and Facilities

The room to the left (fig. 38) is for killing, scalding, and picking. It has concrete block walls, a cement floor, and a 10-foot open ceiling. There are no floor drains in this room. Open drains through the wall to the eviscerating room and open drains through the wall to the outside of the building are provided for the removal of water. This is not an acceptable drainage system. It will be necessary to install a new floor and a proper drainage system in this room. This would be a floor constructed of, or finished with, materials impervious to moisture and graded for complete runoff to trapped floor drains. The floor slope should allow no standing water.

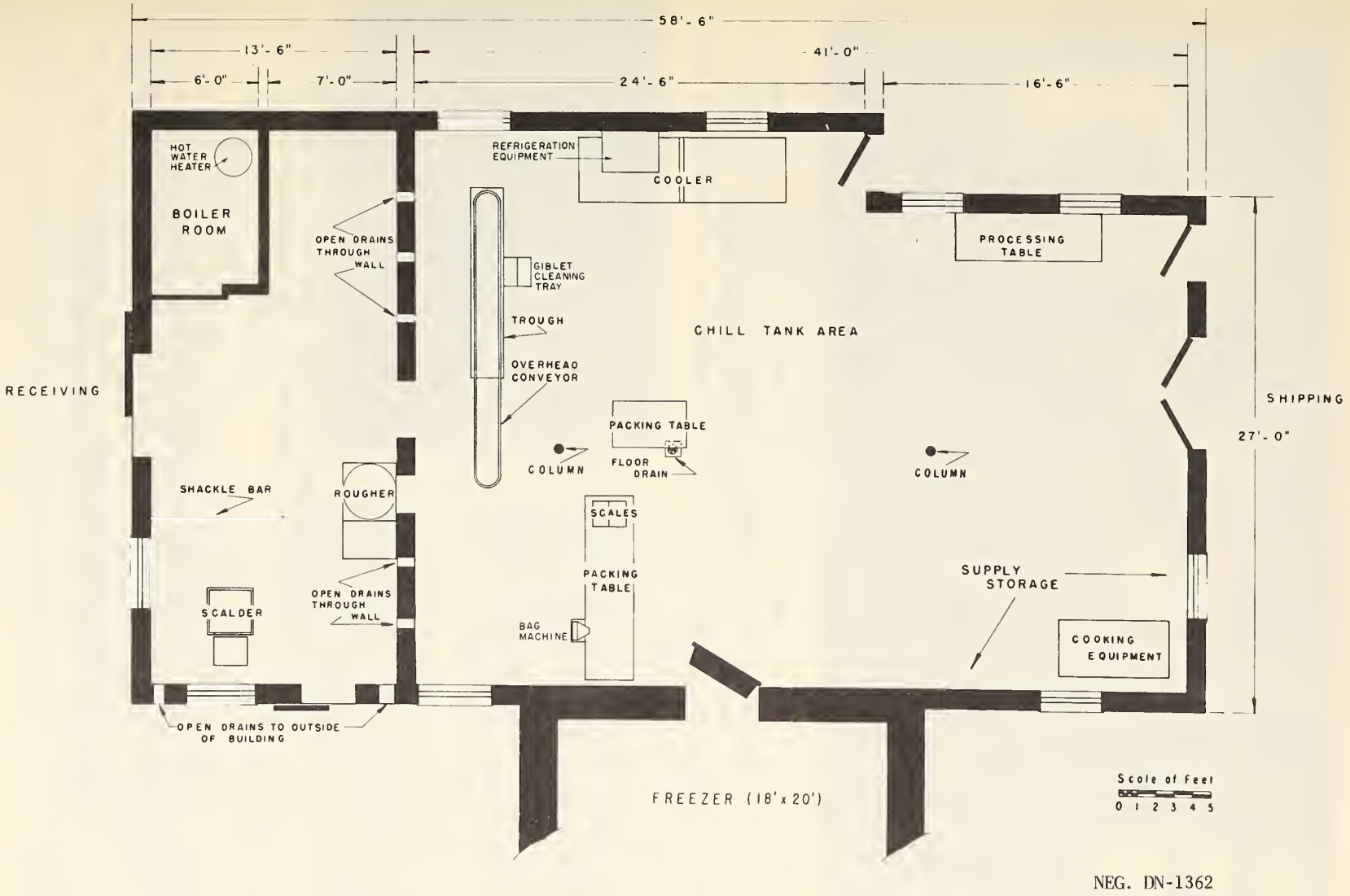


Figure 38.--Plant D layout. Existing facilities.

A grade of about 1/4 inch per foot to drain inlets will provide good drainage. House drain lines should be of sufficient size in diameter to remove readily all water from the plant. A house drain line 4 inches in diameter would serve this scalding and picking operation.

A shackle bar, scalder, and mechanical picker make up the equipment in the poultry dressing room.

The eviscerating area is equipped with a mechanically operated, overhead conveyor. A water-flushed trough, giblet removal and cleaning station, and inside-outside bird washing facilities are provided at the conveyor.

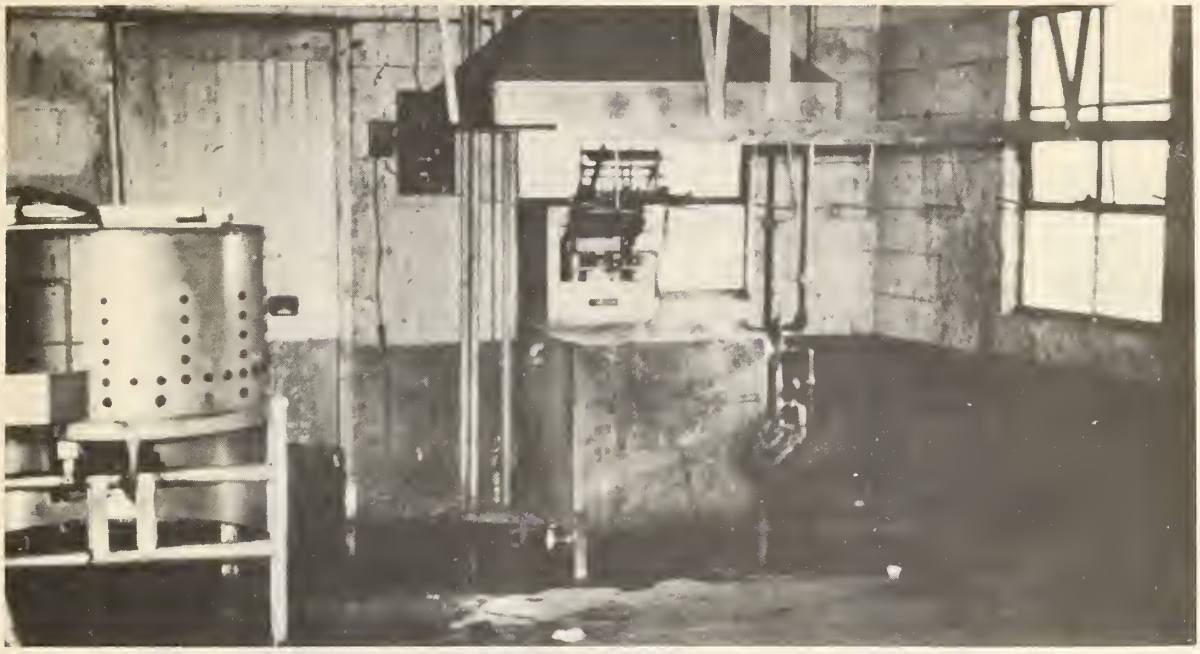
The location of the equipment in the eviscerating, chilling, and packing room in relation to the one floor drain does not lend itself to a clean and sanitary operation. It will be necessary to provide additional floor drains in this room or rearrange the equipment to be in close proximity to the floor drain. The doors of this plant are not self-closing; the windows are not screened; there is no bird washing equipment nor singer after the picking operation; and, there are no hand-washing facilities in the plant. These conditions will have to be corrected.

In the case of sliding doors, such as the one at the left in figure 38, it would be acceptable and probably more economical to install electric fans at the door openings rather than to install self-closing doors. Fans of sufficient capacity and directed at the door openings are effective in preventing the entrance of flies.

It will be necessary to provide a trough or other acceptable facility under the shackle bar (upper right in fig. 39) to confine the blood from the killing operation to a relatively small area. Such facilities were not required in Plant "A" due to the small number of birds processed at any one time. Also, the valley drain in Plant "A" was so located that blood from the killing process spilled almost directly into it and did not create an undesirable or hazardous condition by draining across the floor.

The scalder in the center of figure 39 is the same as in Plant "C" (fig. 29), and should have the same alterations to facilitate maintaining sanitation in the tank. The hood and vented exhaust fan above the scalder is a desirable arrangement for removing steam from the defeathering area. The picking machine on the left is acceptable as to construction and maintenance. Inadequate floor drainage is evidenced by the standing water under the picker and scalder.

Figure 40 shows open drains through the wall separating the dressing and eviscerating operations. It will be necessary to close these openings to prevent water drainage from one room to the other. Open drains through the wall, for passing drainage and refuse onto the ground outside of the buildings, are not permitted under the Regulations. Plant premises, as well as the inside of the plant, should be capable of being maintained in a sanitary manner.



NEG. BN-6434

Figure 39.--Killing, scalding, and picking area.

NEG. BN-6411

Figure 40.--Open drains through wall.

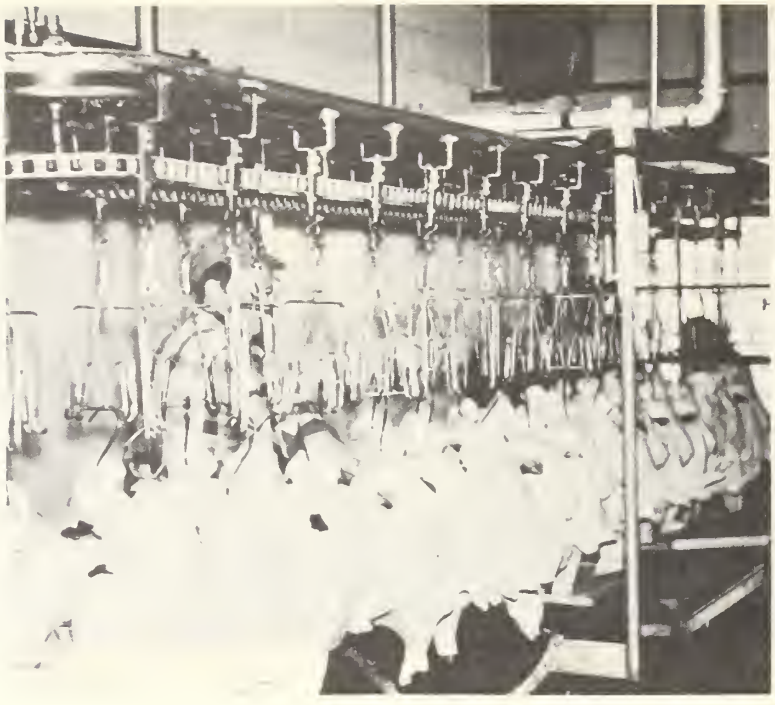
The overhead conveyor used in the eviscerating operation is acceptable as to construction (fig. 41). However, the drain trough under the conveyor has been widened by attaching wood boards along one side. This is not suitable. Noncorrosive metal shelving could be used in place of the wood.

The heart and liver tray attachment, figure 42, is acceptable as to construction, but is unsatisfactory due to the rusty framework. This equipment could be made to be satisfactory by removing the rust.

The poultry is chilled in vats by the use of standing tap water without ice. This will not give proper cooling. Crushed ice and water, air chilling, or other acceptable means should be used for immediate cooling of the product after processing to reduce the internal temperature of the product to 40° F.

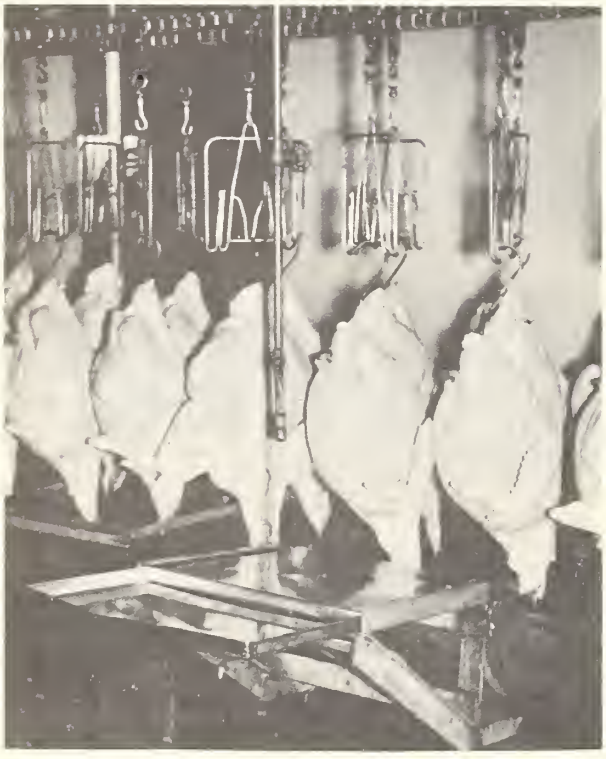
Suggested Plant Layout and Cost of Alteration

Figure 43 shows Plant "D" after the necessary additions and alterations are made. These additions and alterations are:



NEG. BN-6418

Figure 41.--Overhead conveyor.



NEG. BN-6427

Figure 42.--Heart and liver table.

1. Install new floor in the picking room and equip with adequate and proper floor drains.

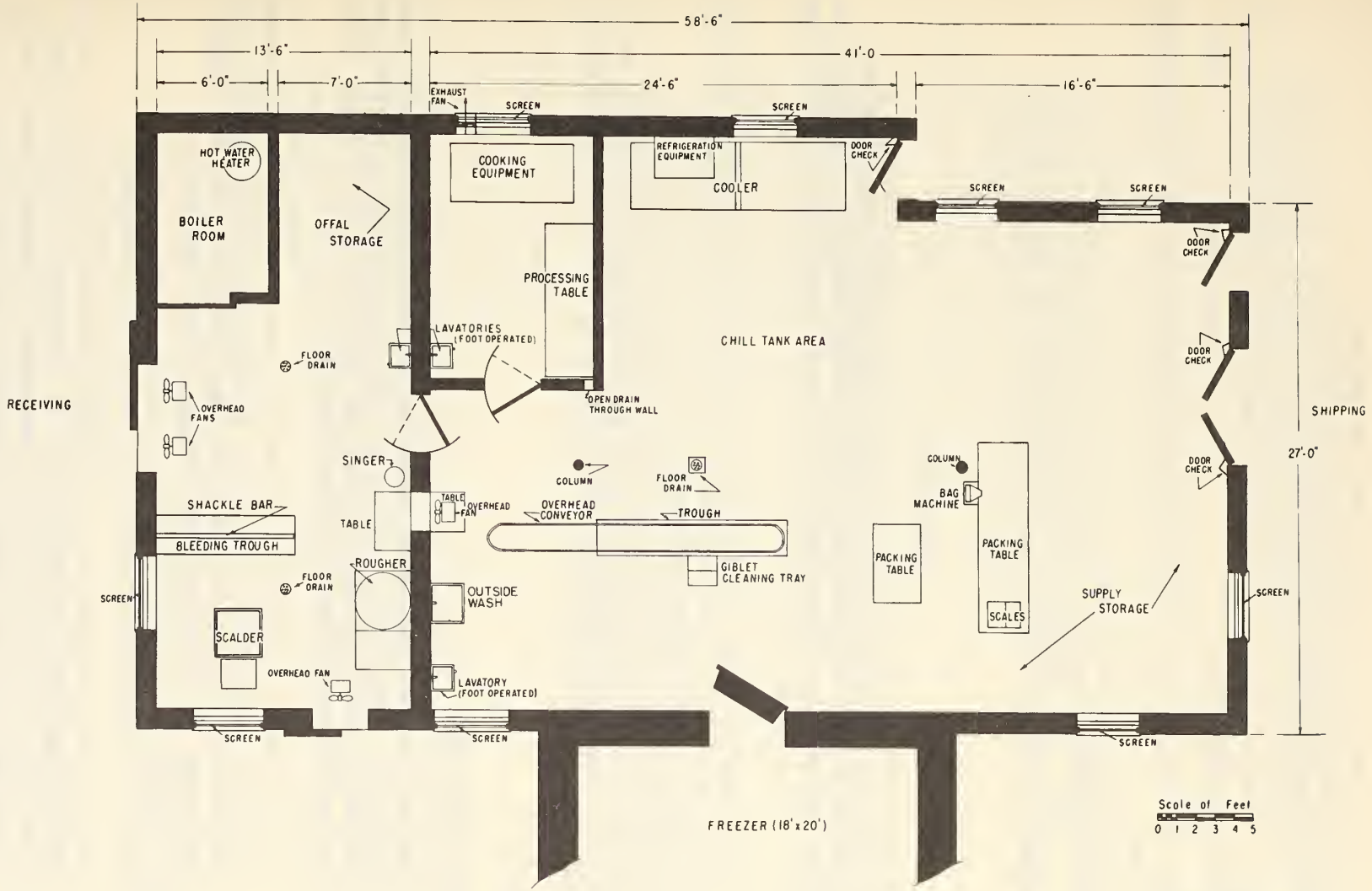
2. Close open drains through the wall separating the dressing and eviscerating rooms and close open drains to the outside of the building.

3. Provide a separate room for the cooking operation and equip room with an exhaust fan.

4. Provide foot-operated hand-washing lavatories in the dressing and eviscerating rooms.

5. Install fans at the outside doorways in the picking room and in the eviscerating room and at the wall opening near the picker.

6. Install a singer after the picking operation.



NEG. DN-1361

Figure 43.--Suggested Plant D layout.

7. Install an outside bird wash after the singer.

8. Provide blood trough at the shackle bar.

9. Replace wood shelving on the drain trough at the eviscerating conveyor with metal shelving.

10. Equip outside doors in eviscerating and packing room with self-closing devices.

11. Screen windows.

The estimated cost for additions and alterations in this plant is $3,500.

CONCLUSIONS

The findings in this report indicate that most small to medium-sized poultry processing plants will need alteration before they can be approved and receive Federal inspection. More changes will be necessary for buildings than for equipment.

The outside construction of buildings is of no particular concern in the analysis for acceptability if the structure is sound and in good repair. Inside construction is of the most importance.

The following building and plant facilities requirements are important to a plant receiving inspection under the Act. Owners should check their plants carefully for these conditions:

I. BUILDINGS

A. Outside openings

1. Doors, windows, skylights, and other outside openings of the plant, except in live poultry receiving and feeding rooms, should be protected by properly fitted screens or other suitable devices against the entrance of flies and other insects.

2. Outside doors, except in live poultry receiving and feeding rooms, should be so hung as to be close fitting when closed. Doors should be provided with self-closing devices where necessary to prevent the entry of vermin into processing and storage rooms.

B. Rooms and compartments

1. Rooms or compartments used for edible products should be separate and distinct from inedible products departments and from rooms where live poultry is held or slaughtered. Separate rooms should be provided when required for conducting processing operations in a sanitary manner. (Examples of acceptable one-room operations are illustrated by Plants "A" and "B").

2. Toilet rooms, opening directly into rooms where poultry products are exposed, should have self-closing doors and should be ventilated to the outside of the building.

C. Floors, walls, ceilings, etc.

1. Floors:

All floors in rooms where exposed products are prepared or handled should be constructed of, or finished with materials impervious to moisture. The floors in killing, ice cooling, ice packing, eviscerating, cooking, boning, or cannery rooms should be graded for complete runoff with no standing water.

2. Walls, posts, partitions, doors:

All walls, posts, partitions, and doors in rooms where exposed products are prepared or handled should be smooth and constructed of, or finished with materials impervious to moisture to a height of 6 feet above the floor. All surfaces above this height must be smooth and finished with moisture-resistant materials.

3. Ceilings:

Ceilings must be moisture-resistant in rooms where exposed products are prepared or handled, finished and sealed to prevent collection of dirt or dust that might sift through floor above or fall from collecting surfaces on equipment or exposed product.

D. Draining and plumbing

1. Drains and gutters:

All drains and gutters should be properly installed with approved traps and vents. The drainage and plumbing system must permit the quick runoff of all water from plant buildings, and of surface water around the plant and on the premises, and all such water should be disposed of in such a manner as to prevent a nuisance or health hazard.

2. Sewage and plant wastes:

a. The sewage system should have adequate slope and capacity to remove readily all waste from the various processing operations and to minimize and, if possible, prevent stoppage and surcharging of the system.

b. Grease traps which are connected with the sewage system should be suitably located, but not near any edible products department or in any area where products are unloaded from, or loaded into vehicles. Such traps should have suitable covers.

c. All floor drains should be equipped with traps, constructed so as to minimize clogging; and the plumbing shall be installed so as to prevent sewage from backing up and flooding the floor. P-U or S-shaped traps are acceptable. Bell type traps are not acceptable.

d. Toilet soil lines should be separate from house drainage lines to a point outside the buildings unless they are positively trapped to prevent backing up. Drainage from toilet bowls and urinals should not be discharged into a grease catch basin.

E. Water supply

1. The water supply must be ample and potable (safe for drinking). There must be ample water pressure to distribute sufficient quantities throughout the plant for all operating needs.

2. An adequate supply of hot water should be available to enable proper cleaning. Hot water hose connections should be provided at convenient locations throughout the plant for cleaning purposes.

3. Nonpotable water is permitted only in those parts of the plant where products are not handled or prepared, and then only for limited purposes such as on condensers not connected with the potable water supply, in vapor lines serving inedible product rendering tanks, and in sewer lines for moving heavy solids in the sewage.

F. Lavatories, toilets, and other sanitary facilities

1. Lavatories:

Adequate hand washing facilities should be in or near toilet and locker rooms and also at other places in the plant as may be essential to the cleanliness of all personnel handling products. Such facilities serving areas where dressed poultry and poultry products are prepared must be operated by other than hand-operated controls, or must be of a continuous flow type providing an ample flow of water for washing hands.

2. Adequate lockers or other facilities should be provided for employees' wearing apparel, and for storing and changing of clothing in the plant. Wearing apparel cannot be stored in rooms where processing operations are conducted.

3. Toilets:

Adequate toilet accommodations should be provided.

G. Lighting and ventilation

1. Lighting:

All rooms in which poultry is killed, eviscerated, or otherwise processed should have at least 30 foot candles of light intensity on all working surfaces, except that at the inspection stations such light intensity should be of 50 foot candles. In all other rooms there should be provided at least 5 foot candles of light intensity when measured at a distance of 30 inches from the floor.

2. Ventilation:

All rooms shall be adequately ventilated to eliminate objectionable odors and minimize moisture condensation.

II. EQUIPMENT AND UTENSILS

A. Refuse containers

Leak-proof refuse containers with covers must be provided, except that perforated containers may be used for the temporary collection of feathers and such containers need not be covered.

B. Scalding equipment

1. Scalding tanks should be constructed and installed so as to prevent contamination of potable water lines and to permit water to enter continuously at a rate which will result in a satisfactory scalding operation. The rate of flow necessary to maintain a sanitary scalding operation will be determined on such factors as the class of poultry and the number of birds per minute going into the scalding tank. It is the responsibility of the Station Supervisor to establish a minimum rate of flow for each scalding tank in each official establishment.

2. The overflow outlets in scalding equipment should be of sufficient size to permit feathers and water to be carried off.

3. The overflow, draw-off valves, and sediment basin drain should discharge into a floor or valley drain, or onto the floor in close proximity to a floor or valley drain.

C. Conveyors

1. Conveyors used in the preparation of ready-to-cook poultry must be of metal or other acceptable material and of such construction as to permit easy identification of viscera with its carcass and so designed as will present each carcass or all parts thereof in a way that will permit adequate and efficient inspection.

2. Overhead conveyors should be so constructed and maintained that they will not allow grease, oil, or dirt to accumulate on the drop chain or shackle which should be of noncorrosive metal.

3. Nonmetallic belt-type conveyors used in moving poultry products should be of waterproof composition.

4. When individual trays are not used during eviscerating operations, each carcass must be suspended and a metal trough or a trough constructed of other acceptable impervious material shall be provided beneath the conveyor to extend from the point where the carcass is opened to the point where the viscera has been completely removed, and such troughs must be flushed continuously by a water spray.

5. In plants where no conveyors are used, each carcass can be eviscerated in an individual metal tray of seamless construction or in a tray of other acceptable, impervious material and construction.

D. Chilling and defrosting tanks

Chilling and defrosting tanks must be constructed of metal or other suitable material impervious to moisture and be of seamless construction with edges rolled outward. Where mechanical devices are not used for removing carcasses from the chilling or defrosting tanks, the tanks should be of a size that will enable employees to remove poultry without getting inside the tanks.

E. Tables

Inspection, eviscerating, and cutting tables must be made of metal or other acceptable material, have coved corners, and be constructed and placed so as to permit thorough cleaning.

F. Bird washing equipment

Water spray washing equipment with sufficient water pressure to thoroughly and efficiently wash carcasses must be used for washing carcasses inside and out.

G. Mechanical pickers

When mechanical pickers are used they should be installed so as to be accessible for thorough cleaning and removal of the accumulation of feathers.

H. Offal receptacles

Watertight metal receptacles must be used for entrails or other waste resulting from preparation of eviscerated poultry.

I. All equipment should be placed so as to be readily accessible for all processing and cleaning operations.

In this report, the most recurring building needs are screens on windows, self-closing devices on doors, and processing room walls impervious to moisture. Unfinished or improperly finished wood and other porous materials are not acceptable for walls, posts, partitions and doors in rooms where exposed products are handled or stored because they are absorbent and difficult to keep clean. Such materials are acceptable only if they are covered, coated, or

treated in such a way that moisture cannot penetrate to them. Ceramic tile, metal tile, metal panels, cement plaster, and some forms of paint and plastic are among materials acceptable as impervious.

Much of the equipment in use is acceptable without alteration. Some additional equipment is needed. Adequate bird-washing and eviscerating facilities are needed to provide sanitary operations.

Bird-washing equipment cannot be of the "community bath" type. Poultry carcasses must be washed individually by water spray. Eviscerating tables or lines must provide a means for keeping carcasses separated and identifiable with their viscera. This can be accomplished by the use of individual hanging devices and/or individual trays.

There is no objection to the use of homemade equipment if that equipment suits the sanitary needs of the operation and its construction permits proper and thorough cleaning. Smooth, noncorrosive metal or other impervious material should be used in the construction of equipment.

Based on alterations necessary for the plants in this report, it may be assumed that most small to medium-sized poultry-processing plants can be modified to comply with Federal inspection Regulation standards for a moderate cost.

U. S. GOVERNMENT PRINTING OFFICE : 1958 O - 471744